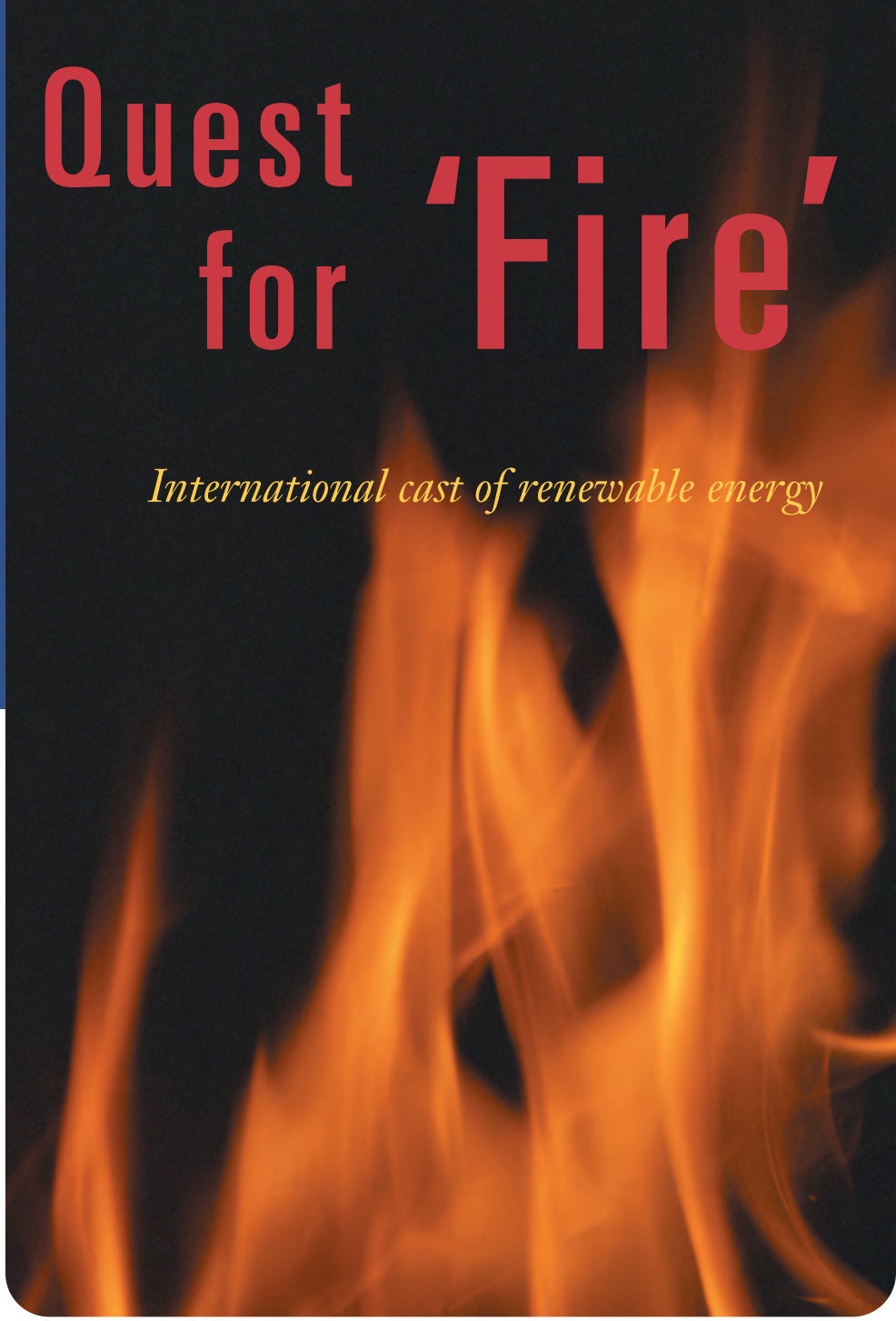
The New Quest for 'Fire'



International cast of renewable energy

By Dan Campbell, Editor

Editor's note: for the complete texts of major addresses and many PowerPoint presentations made during the WIREC 2008 conference, visit: www.wirec2008.gov/wps/portal/wirec2008.

The bad news for energy consumers is clear: the world is running out of fossil fuels. The good news is equally clear: the world is running out of fossil fuels.

Although contradictory at first glance, the two statements — made by Herman Scheer, general counsel for the World Council of Renewable Energy — are anything but. According to Scheer and many other speakers at a three-day international conference on renewable energy, the depletion rate and skyrocketing costs of fossil fuels and the corresponding development of "green power" will ultimately help fight global warming.

Speaking at the WIREC 2008 Conference in Washington, D.C., in March, Scheer described the pursuit of renewable energy as "a race against time," in which the world has "only a few decades, not centuries" to change the way it produces and consumes energy. He called the changeover from the fossil-fuel economy the "major challenge of the 21st century."

And the challenge grows daily. U.S. Energy Secretary Samuel Bodman cited estimates that the world's primary energy needs will grow by more than 50 percent by 2030. "Meeting this demand will require the investment of billions of dollars annually for decades, around the world and at all stages of the energy cycle," he said.

To help meet this challenge, WIREC '08 (Washington International Renewable Energy Conference) brought together more than 3,000 delegates (including government, industry and academic leaders) from 113 countries, all with the same basic goal: to accelerate the development and deployment of all types of renewable energy. In dozens of often-packed conference halls and meeting rooms, participants discussed issues as diverse as developments in carbon-trading markets, the role of forestry in renewable energy, how to "plug in" new energy sources to the existing power grid and virtually every other issue crucial to the rapidly developing "green-power" industry.

The overall atmosphere of the conference was something

experts comes to grips with 'challenge of the century' at WIREC '08

Agriculture Secretary Ed Schafer called WIREC '08 the "first global conference…that recognizes the importance of agriculture to renewable energy." Below, President Bush said the $1 billion invested by the federal government in cellulosic ethanol research will promote non-food sources for biofuel. USDA Photos by Bob Nichols

like a combination United Nations/energy-industry think tank, geared toward accelerating the quest for renewable energy.

Promoting energy security

Regardless of where one stands on the global warming debate, the development of home-grown, renewable energy is the key to energy security for America; the nation must wean itself of its dangerous and expensive addiction to imported oil, President George W. Bush stressed in his keynote speech.

The President also called for creation of an international, clean-technology fund under which wealthy nations would help poorer nations clean up their environments. "I call on our Congress to commit $2 billion to the fund," the President said. "And in my travels in my last year of the presidency, I'm going to call on other wealthy nations to contribute to this fund."

Real life, hands-on evidence of how far this industry has come in a relatively short period of time was on display at a renewable energy trade show that filled the main exhibit hall of the Washington Convention Center. Exhibits there promoted everything from the latest wind-power-generating equipment to new methods for finding and drilling for geothermal power (see page 12).

President vows no retreat on biofuels

Underscoring how serious America's imported-oil addiction has become, President Bush noted that in 1985, 20 percent of America's oil came from abroad. "Today, that number is nearly 60 percent," Bush said. "The dependency upon oil puts us at the mercy of terrorists."

Bush said the nation's basic energy strategy must be twofold: "One, we're going to change the way we drive our cars; and two, we'll change the way we power our businesses and homes."

The federal government has spent more than $12 billion since 2000 for research and development of alternative energy, Bush noted, adding that the 2007 Energy Bill raises the mandatory fuel economy standard to 35 miles per gallon by 2020 and requires the use of 36 billion gallons of renewable fuel by 2022.

Bush called biodiesel "the most promising" of the biofuels, and said the 450 million gallons of biodiesel produced last year is up 80 percent from 2006. Likewise, he said ethanol production has quadrupled, from 1.6 billion gallons in 2000 to more than 6.4 billion gallons in 2007. "Last year we accounted for nearly half of the worldwide ethanol production."

But the President acknowledged that "a lot of challenges"

arise whenever such a massive new demand is placed on the nation's grain stocks. "If you're a hog-raiser in the United States, you're beginning to worry about the cost of corn to feed your animals. I'm beginning to hear complaints from our cattlemen about the high price of corn." Higher corn prices are also beginning to affect the price of food, he observed.

"And so, we've got to do something about it. The best thing to do is not to retreat from our commitment to alternative fuels, but to spend research and development money on alternatives to ethanol made from other materials," he said. Bush cited the $1 billion invested by the government to make cellulosic ethanol more cost competitive as an example of what needs to be done. In just a few years, the projected cost of cellulosic ethanol has already dropped by 60 percent, Bush said.

"I look forward to the day when Texas ranchers can grow switchgrass…and then have that switchgrass converted to fuel. I look forward to the day when people in the parts of our country that have a lot of forests are able to convert wood chips into fuel. And those days are coming."

Plug-in hybrid car technology is advancing rapidly toward meeting a short-term goal to develop vehicles that can be driven for the first 40 miles on electricity, he said. He also noted that $1.2 billion in research funds are being spent on hydrogen-power vehicles.

Agriculture and energy production converging

Agriculture Secretary Ed Schafer said WIREC '08 marked "the first global conference of this magnitude that recognizes agriculture's importance as a driver of renewable energy. I'm glad agriculture has a seat at the table now, because agricultural and rural areas are the primary contributors to renewable energy."

Displacing 1 billion barrels of imported oil (at $100 per barrel) with biofuels could double the level of farm income from the $96 billion expected this year to nearly $200 billion, Schafer said. To reach that level would mean boosting the 9 billion gallons of biofuel expected to be produced this year to 42 billion gallons annually.

"Renewables have clearly boosted our farm economy and have spread positive effects across our broader economy as well," Schafer continued. "The potential benefits are clear: more stable demand for energy crops drives up prices. Higher prices drive up farm income and farmland values. And it's the farmers and rural residents who stand to benefit."

These benefits extend far beyond the farm field, since processing plants nearby are needed "to turn those feedstocks into fuels. That means jobs, investment and income."

The beneficial impact of the trend toward renewable-energy agriculture means proportionately even more for the majority of the world's nations, which depend on agriculture for a much greater share of their gross national product than does the United States, he observed.

Advances in the conversion technology used to process feedstocks into energy are also needed. "Our scientists are working on this issue now, and are collaborating with our university partners on a number of exciting projects to improve the fermentation process for ethanol," Schafer said. "Similar technological advances are required in the fields of solar, hydro, geothermal and wind energy."

Schafer said the proposed budget for USDA contains an additional $25 million for research on the modification of plant cell walls and crop residues, and an additional $19 million for research on bioenergy and bio-based fuels. To further this effort,

Paradigm shifting on nuclear power

If there was a surprise in President Bush's address at WIREC, it was perhaps the emphasis that he placed on nuclear power. "I strongly believe the United States must promote nuclear power," the President said, adding that "nuclear power is limitless…and it generates a massive amount of electricity without causing air pollution or any greenhouse gases."

Yet, he said, the U.S. nuclear industry has been at a virtual standstill for many years while "France, our ally and friend, gets nearly 80 percent of its power from nuclear power."

Bush said his administration is working to eliminate the barriers to development of nuclear power plants, and last year invested more than $300 million in nuclear energy technologies. "We want our people to understand that this generation of nuclear power plants is safe."

"We've also launched a program called Nuclear Power 2010," Bush said, noting that this industry-government partnership has already resulted in six applications to build new U.S. nuclear power plants, with 13 more applications expected to be submitted this year. "The paradigm is beginning to shift," he said, adding that construction will be supported by $18.5 billion in government loan guarantees.

The President also hailed the growth of the wind-energy industry, which he said has jumped more than 300 percent since 2000. More than 20 percent of new electrical generating capacity added in America came from wind last year, he said. Gains in development of advanced solar energy are also encouraging, Bush said, noting that more than $1 billion is being invested in solar power research.

Schafer announced the awarding of $18.4 million in grants from USDA and DOE for 21 biomass research and development projects.

Inventing the future

"The best way to predict the future," said Vinod Khosla, "is to invent it."

Khosla — founding CEO of Sun Microsystems and a billionaire venture capitalist who has started a number of renewable energy businesses and made major investments in biofuels — cautioned people not to be overly ready to accept the dire predictions of environmentalists regarding global warming. For example, he has noted that rising temperatures could result in increased plant growth, which could actually decrease carbon dioxide levels in the atmosphere.

Most forecasts about the future are invariably wrong, Khosla stressed. To make his point, he cited a number of examples of "expert predictions" that proved to be wildly inaccurate. For example, one respected economic forecasting firm predicted a rate of increase in demand for mobile phone services that underestimated actual demand by 600 percent. And few, if any, predicted the 500 percent decline in the cost of transistors that the electronics industry has benefited from, he noted.

Casting a gaze into his own crystal ball, Khosla predicted that $1 per gallon cellulosic ethanol and clean-energy electricity for 7 cents per kilowatt are on the horizon.

A "cap and trade" system for carbon emissions could pay for most of the changeover to renewable energy production, he said. Such a program would set mandatory limits (a cap) on carbon dioxide emissions and create a market in which allowances to emit the gas could be traded. This cap could be set lower than existing emission levels, and then be reduced over time.

Interest in this concept is growing rapidly, as indicated by the standing-room-only crowd of perhaps 200 people that jammed a breakout session on carbon trading. When the same topic was covered at another energy summit several years ago, the number of speakers on the panel outnumbered the people in the audience.

Renewable energy could help pull much of the world out of poverty, Khosla said, noting that biomass energy could result in a $500 billion transfer to Africa and Latin America. "It would prove far more valuable than foreign aid and debt forgiveness."

"Food vs. fuel is not a relevant debate because it will really not take that much land to do biofuel the right way," Khosla said.

He has estimated that if U.S. agriculture would divert 80 million acres of land that grow commodity crops for export to energy crop production (which developing nations would support, since they believe American ag exports depress their own farm sectors), and combine that land with 40 million acres of conservation-reserve program lands which could be planted with energy crops, we would have 120 million acres for biofuel.

Pledges for the future

Conference participants were encouraged to make formal pledges of what they will do to promote renewable energy. More than 130 pledges were collected, including:

- Nations as diverse as Egypt and the Netherlands vowed to produce 20 percent of their power from renewable energy by 2020;
- Denmark pledged to increase its renewable energy share to at least 30 percent by 2025;
- Canada committed to adopting new tax incentives that will accelerate the rate of renewable and clean energy development;
- Tanzania pledged that 1 million residents would gain access to electricity from renewable energy resources;
- Cape Verde committed to increasing renewable sources of energy to 50 percent of market share by 2020, with one island running completely on renewable energy by that time;
- Indonesia pledged to enact a new national energy policy that will rely more on conservation and energy diversification.

Under Secretary for Rural Development Thomas Dorr called renewable energy "an immense opportunity for farmers and rural communities." USDA photo by Bob Nichols

Growing our way to a cleaner future

Under Secretary for Rural Development Thomas Dorr stressed that the energy revolution now upon us is a unique

continued on page 37

The New Quest for 'Fire'

continued from page 11

opportunity for rural people. "I have long argued that in the United States, renewable energy is the biggest opportunity for economic growth and wealth creation in our lifetimes. I am convinced, after our discussions [here], that this perception is shared around the world," Dorr said in remarks summarizing some of the conference highlights.

"There is, above all, a universal recognition that renewable energy is indeed an immense opportunity for farmers and rural communities. No one wants to sit this one out," Dorr said. "We must, as President Bush reminded, grow our way to a cleaner future."

He stressed that the changeover to a renewable energy industry will not succeed if it hinders economic growth. "For much of the world, economic growth remains a life-or-death issue … and time is a life-or-death variable," Dorr continued. To dramatize this, he noted that "80 percent of people in sub-Saharan Africa have no access to electricity, 100 years after the invention of the light bulb."

Dorr said the food vs. fuel debate is manageable, as indicated by the many conference speakers who described significant gains in expected crop yields thanks to new seed and growing technologies. Further, he pointed to experts from around the world who described under-utilized agricultural resources that can be put into production, and advances being made in second- and third-generation feedstocks so that biofuels can be produced from non-food crops.

"So from an agricultural perspective, the question is not food vs. fuel — it is food *and* fuel. And both are opportunities for agriculture."

Dorr noted that several presenters emphasized the need for micro-lending to support small-scale, off-grid power generation. "A modern rural credit and banking system is a necessary threshold condition for self-sustaining rural growth."

Global imperative

Energy Secretary Bodman said there is now a global imperative to act. "In this country, as perhaps never before, the American people are calling for action — and taking action themselves."

Wealthy, industrialized nations "must keep the energy needs of the world's poorest nations in our discussions," Bodman said. "A major global effort to promote renewable energy will support economic growth and allow developing nations to 'leap-frog' over some of the dirtiest, but most rudimentary and prevalent, fossil-fuel-based technologies — improving public health and our environment." ■

Raising the Standard

continued from page 19

once they join the board?

Chesnut: West Central has a policy of finding strong board members. In the late 1980s, we started an associate director program that allowed us to have one or two associate (non-voting) directors on the board who serve alongside regular directors. They attend all the meetings and go through all decision-making processes. They do not necessarily become regular board members, but they have the potential to do so. It allows more people to bring input back to the board and to relay information to the membership. The board works with the nominating committee each year to help identify the type of skills an individual needs to make a good candidate.

Once on the board, we stress ongoing education. We have outside experts come in to help with strategic planning, and we attend the National Council of Farmer Cooperatives meetings, which include strong board education programs. The Iowa Institute of Cooperatives also has good educational programs. West Central also has an education program for employees, and board members participate in that as well.

Q. What major projects are on the West Central drawing board right now?

Chesnut: We are always looking for value-added opportunities, and have three or four new products in the development stage, but can't really discuss them at this point. They involve converting soybean meal into other products.

Q. How do you think the co-op will be different in 10 years?

Chesnut: I'm sure that technology will make huge changes that we are not even aware of yet. Changes are occurring so rapidly, it is almost hard to keep up. The size of operations that we deal with will be bigger, and we will have to move faster.

Q. What basic advice can you offer to the leaders of other local co-ops that might want to emulate West Central's success?

Chesnut: Over 75 years, one thing West Central has always had is strong management. We've been very fortunate that the co-op has had only a small number of managers [three], which has been a great benefit. Each of those managers were able to take what was on the table when they came in and grow the organization and make it stronger than it was. Long-range strategic planning has been something that has helped West Central look forward and develop our programs, facilities and personnel.

Stroburg: Looking at the long-range strategy every six months does two things: either it confirms that you have the right strategy, or, if that can't be confirmed, it means the strategy should change. It also reminds everybody of where we are headed. ■